What Is Claimed Is:

1. A replication-competent herpes simplex virus that is incapable of expressing both (i) a functional γ34.5 gene product and (ii) a ribonucleotide reductase.

2. A herpes simplex virus vector, wherein the genome of said viral vector contains alterations in both (i) the γ34.5 gene and (ii) the ribonucleotide reductase gene.

3. A method for killing tumor cells in a subject, comprising the step of administering to said subject a pharmaceutical composition comprising

(A) a herpes simplex virus vector that is altered in (i) the γ34.5 gene, and (ii) the ribonucleotide reductase gene; and

(B) a pharmaceutically acceptable vehicle for said vector,

such that said tumor cells are altered *in situ* by said vector, whereby said tumor cells are killed.

4. The method of claim 3, wherein said tumor cells are of a type selected from the group consisting of astrocytoma, oligodendroglioma, meningioma, neurofibroma, glioblastoma, ependymoma, Schwannoma, neurofibrosarcoma, and medulloblastoma.

5. The method of claim 3, wherein said tumor cells are selected from the group consisting of melanoma cells, pancreatic cancer cells, prostate carcinoma cells, breast cancer cells, lung cancer cells, colon cancer cells, lymphoma cells, hepatoma cells and mesothelioma and epidermoid carcinoma cells.

6. A method for killing tumor cells in a subject, comprising the steps of administering to said subject a

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herpes simplex virus vector, wherein said vector comprises a tumor cell-specific promoter wherein said promoter controls expression of at least one viral protein necessary for viral replication and wherein said promoter is induced selectively or at a higher level in tumor cells than in normal cells.

7. The method of claim 6, wherein said promoter is selectively capable of expression in nervous system tumor cells.

8. The method of claim 6, wherein said tumor cells are of a type selected from the group consisting of glioblastoma, medulloblastoma, meningioma, neurofibrosarcoma, astrocytoma, oligodendroglioma, neurofibroma, ependymoma and Schwannoma.

9. The method of claim 6, wherein said tumor cells are of a type selected from the group consisting of melanoma, lung cancer, prostate carcinoma, breast cancer, pancreatic cancer, colon cancer, lymphoma, hepatoma and mesothelioma and epidermoid carcinoma.

10. The method of claim 6, wherein said vector is altered in the γ34.5 gene and the ribonucleotide reductase gene.

11. A method of preparing a replication-competent vector of a herpes simplex virus, said method comprising the steps of:

(A) isolating a viral genome of said herpes simplex virus; and

(B) permanently altering said genome so that the virus is (1) sensitive to antiviral agents, (2) kills tumor cells and (3) expresses decreased generalized neurovirulence.

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12. The method of claim 11, wherein said herpes simplex virus of said vector is HSV-1.

13. The method of claim 11, wherein said herpes simplex virus of said vector is HSV-2.

14. A method of protecting a subject against herpes simplex virus infection, said method comprising the step of administering to said subject a pharmaceutical composition comprising

(A) a herpes simplex virus vector wherein the genome of said virus is altered in (i) the γ34.5 gene, and (ii) the ribonucleotide reductase gene; and

(B) a pharmaceutically acceptable vehicle for said vector.

15. A method of eliciting an immune response to a tumor cell, comprising the step of administering to said subject a pharmaceutical composition comprising:

(A) a herpes simplex virus, wherein the genome of said virus (i) contains an expressible non-herpes simplex virus nucleotide sequence encoding a desired protein capable of eliciting an immune response in said subject, and (ii) is altered in the γ34.5 gene, and the ribonucleotide reductase gene; and

(B) a pharmaceutically acceptable vehicle for said virus.

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